Amendments to the Specification

Please replace paragraphs 18, 46 and 49 with the following amended paragraphs bearing corresponding numbers.

[0018] Embodiments of the present invention will now be described, by way of example only, with reference to the attached Figures, wherein:

Fig. 1 illustrates a first embodiment of a system used to perform a method of manufacturing an optical connector according to the present invention;

Fig. 2 illustrates a second embodiment of a system used to perform a method of manufacturing a an optical connector according to the present invention;

Fig. 3 illustrates a third embodiment of a system used to perform a method of manufacturing an optical connector according to the present invention;

Fig. 4 illustrates a system used to locate a workpiece with respect to a machining laser focus according to the present invention;

Fig. 5 illustrates an example of a method of writing bent waveguides in a transverse mode using a tailored focus in a connector according to the present invention;

Fig. 6 illustrates an example of a method of writing bent waveguides in a longitudinal mode by rotating the workpiece, in a connector according to the present invention;

Fig. 7 illustrates a fourth embodiment of a system used to perform a method of manufacturing an optical connector according to the present invention;

Fig. 8 illustrates waveguides bent through 90^{o} using internal reflection in a connector according to the present invention;

Fig. 9 illustrates assisting transfer between orthogonal waveguides using photonic crystal structures in a connector according to the present invention;

~~Fig. 10~~ Figs. 10A and 10B ~~illustrates~~ illustrate connecting waveguide arrays attached to orthogonal faces of a single dielectric block in a connector according to the present invention;

Fig. 11 illustrates stacked slabs of femtosecond laser-written waveguides connecting waveguide arrays in a connector according to the present invention;
Fig. 12 illustrates orthogonal waveguides within a prism according to a connector of the present invention;
Fig. 13 illustrates a fixed/fixed configuration of a connector according to the present invention with two precision dimension blocks; and
Fig. 14 illustrates a connector according to the present invention using photonic crystal structures.

[0046] A further configuration permits optical connection of attached waveguide arrays to attached waveguide arrays in a single block of dielectric. In this configuration, shown in ~~Figure 10~~ Figures 10A and 10B, arrays of optical components **100** are attached to one block face **102** and connected by internal waveguides **104** to other arrays **106** on an orthogonal block face **108**. The arrays are attached to orthogonal faces since it would be very difficult for the imaging system to locate the guides if they were on opposing faces and be able to deliver femtosecond laser light to connect them without the attached guides blocking the laser beam. Methods for writing such bent waveguides **104** are given above. FLDM writing of waveguides is not restricted to blocks of dielectric material but can include other geometries such as slabs **110** which can be stacked as shown in Figure 11.

[0049] Figure 14 shows a configuration using photonic crystal structures to assist in guiding light around tight bends. This example demonstrates how photonic crystal structures **122** can be used to assist light guiding around tight bends in the plane of an accessible surface. After the photonic crystal structures **122** have been etched, external components **124** can be attached to the blocks and internal waveguides **126** can be written from them (as shown in ~~Figure 10~~ Figures 10A and 10B) to just enter the photonic crystal bend zone, thereby completing the optical connection. Multiple photonic crystal arrays can be written on the top of the block to provide complicated bending and light redirection functions. The use of

photonic crystal technology to dispense with large 4 mm radius bends can shrink the size of the optical connector significantly, and also lowers the connector loss.